

WHAT IS CLAIMED IS:

CLAIMS

1. A wireless device comprising:
a first section coupled to a first antenna and comprising a first transmit path and a first receive path for a first wireless system and further comprising a first transmit path and a first receive path for a second wireless system; and
a second section coupled to a second antenna and comprising a second receive path for the first wireless system and a second receive path for the second wireless system, wherein the first and second receive paths for the first wireless system are for two frequency bands, and wherein the first and second receive paths for the second wireless system are for a single frequency band.
2. The wireless device of claim 1, wherein each transmit path comprises a power amplifier (PA).
3. The wireless device of claim 1, wherein each receive path comprises a filter and a low noise amplifier (LNA).
4. The wireless device of claim 1, wherein the first section further comprises a duplexer coupled to the first transmit path and the first receive path for the second wireless system.
5. The wireless device of claim 4, wherein the first section further comprises a transmit/receive (T/R) switch coupled to the first antenna, the first transmit path for the first wireless system, the first receive path for the first wireless system, and the duplexer.
6. The wireless device of claim 5, wherein the T/R switch is a single-pole three-throw (SP3T) switch.
7. The wireless device of claim 1, wherein the first receive path for the second wireless system is compliant with performance requirements of the second

wireless system, and wherein the second receive path for the second wireless system is non-compliant with at least one of the performance requirements.

8. The wireless device of claim 1, wherein the second antenna is isolated from the first antenna by at least 22 decibels (dB).

9. The wireless device of claim 1, further comprising:
a radio frequency (RF) unit coupled to the first and second sections and operable to perform signal conditioning for RF transmit signals for the first transmit paths for the first and second wireless systems and to further perform signal conditioning for RF received signals from the first and second receive paths for the first and second wireless systems.

10. The wireless device of claim 9, wherein the RF unit is operable to perform modulation and frequency upconversion on baseband transmit signals to obtain the RF transmit signals, and to perform frequency downconversion and demodulation on the RF received signals to obtain baseband received signals.

11. The wireless device of claim 10, wherein the RF unit performs modulation and frequency upconversion utilizing direct-conversion from baseband directly up to RF.

12. The wireless device of claim 10, wherein the RF unit performs frequency downconversion and demodulation utilizing direct-conversion from RF directly down to baseband.

13. The wireless device of claim 1, wherein the first section further comprises a third receive path for the first wireless system, wherein the second section further comprises a fourth receive path for the first wireless system, and wherein the first, second, third, and fourth receive paths for the first wireless system are for four frequency bands.

14. The wireless device of claim 13, wherein the first and second receive paths for the first wireless system are for two commonly used frequency bands, and wherein the third and fourth receive paths for the first wireless system are for two less commonly used frequency bands.

15. The wireless device of claim 13, wherein the first section further comprises a second transmit path for the first wireless system, and wherein each of the first and second transmit paths for the first wireless system covers two of the four frequency bands.

16. The wireless device of claim 1, wherein the first section further comprises a second transmit path and a third receive path for the second wireless system, wherein the second section further comprises a fourth receive path for the second wireless system, and wherein the second transmit path and the third and fourth receive paths for the second wireless system are for a second frequency band of the second wireless system.

17. The wireless device of claim 1, wherein the first section further comprises a second transmit path and a third receive path for the first wireless system and a second transmit path and a third receive path for the second wireless system, wherein the second section further comprises a fourth receive path for the first wireless system and a fourth receive path for the second wireless system, wherein the first, second, third, and fourth receive paths for the first wireless system are for four frequency bands, and wherein the third and fourth receive paths for the second wireless system are for a second frequency band of the second wireless system.

18. The wireless device of claim 1, wherein the first wireless system is a Time Division Multiple Access (TDMA) system, and wherein the second wireless system is a Code Division Multiple Access (CDMA) system.

19. The wireless device of claim 18, wherein the first wireless system is a Global System for Mobile Communications (GSM) system.

20. The wireless device of claim 1, further comprising:
a third section coupled to a third antenna and comprising a receive path for a satellite positioning system.

21. The wireless device of claim 20, wherein the satellite positioning system is Global Positioning System (GPS).

22. A wireless transmitter/receiver (transceiver) comprising:
a first section coupled to a first antenna and comprising a transmit path and a first receive path for a first wireless system and further comprising a transmit path and a first receive path for a second wireless system; and
a second section coupled to a second antenna and comprising a second receive path for the first wireless system and a second receive path for the second wireless system, wherein the first and second receive paths for the first wireless system are for two frequency bands, and wherein the first and second receive paths for the second wireless system are for a single frequency band.

23. The transceiver system of claim 22 and utilized in a wireless device.

24. The transceiver system of claim 22 and utilized in a base station.

25. An apparatus comprising:
means for performing signal conditioning for a transmit path and a first receive path for a first wireless system;
means for performing signal conditioning for a transmit path and a first receive path for a second wireless system;
means for coupling the transmit path and the first receive path for the first wireless system and the transmit path and the first receive path for the second wireless system to a first antenna;
means for performing signal conditioning for a second receive path for the first wireless system;
means for performing signal conditioning for a second receive path for the second wireless system; and

means for coupling the second receive path for the first wireless system and the second receive path for the second wireless system to a second antenna, wherein the first and second receive paths for the first wireless system are for two frequency bands, and wherein the first and second receive paths for the second wireless system are for a single frequency band.

26. The apparatus of claim 25, wherein the first wireless system is a Time Division Multiple Access (TDMA) system, and wherein the second wireless system is a Code Division Multiple Access (CDMA) system.

27. A wireless device comprising:

a first section coupled to a first antenna and comprising a first transmit path for a first wireless system and a second transmit path for a second wireless system, wherein the first antenna is used for transmitting data to the first and second wireless systems; and

a second section coupled to a second antenna and comprising a first receive path for the first wireless system and a second receive path for the second wireless system, wherein the second antenna is used for receiving data from the first and second wireless systems.

28. A method of operating a wireless device, comprising:

coupling, via a transmit/receive (T/R) switch, a transmit path for a first wireless system, a first receive path for the first wireless system, or both a transmit path and a first receive path for a second wireless system to a first antenna; and

coupling a second receive path for the first wireless system and a second receive path for the second wireless system to a second antenna, and

wherein the first and second receive paths for the first wireless system are for two frequency bands, and wherein the first and second receive paths for the second wireless system are for a single frequency band.